REMARKS

Claims 1-15 are currently pending in the application. Reconsideration of the rejected claims in view of the following remarks is respectfully requested.

35 U.S.C. §102 Rejection

Claims 1-15 were rejected under 35 U.S.C. §102(b) for being anticipated by U. S. Patent No. 5,734,865 to Lu. This rejection is respectfully traversed.

The claimed invention is related to an IP data transmission network using a route selection based on level 4/5 information. In one aspect of the invention, the router includes logic for identifying and extracting higher-layer information carried by at least one of the layers above the lowest three layers of a communication protocol of a received packet. A configuration table associates the higher-layer information with lower-layer information carried by at least one of the lowest three layers and a routing table determines routing of the packet, responsive to the lower-layer information. In one application, each router within the intermediary nodes along the data path from the ingress node to the egress node determines the best route in a routing table defined by the contents of a field contained in each packet of data being received. For this, the router of the ingress node comprises a configuration table which defines the contents of the field, the TOS field in the preferred embodiment, in function of information associated with a protocol having a level upper than the IP level, generally the 4/5 level such as TCP or UDP.

A method of the invention comprises, for example,

a) extracting higher-layer information carried by at least one of the layers above the lowest three layers of a communication protocol of a packet;

b) associating the higher-layer information with lower-layer information carried by at least one of the lowest three layers of the communication protocol,

c) using the lower-layer information to select a route for the packet through the network by accessing a routing table containing a plurality of routes.

In another method of the invention, the steps include, for example,

a) receiving a packet;

b) identifying and extracting higher-layer information carried by at least one of the layers above the lowest three layers of a communication protocol of the received packet;

c) associating the higher-layer information with lower-layer information carried by at least one of the lowest three layers of the communication protocol by accessing a configuration table; and

d) determining routing of the packet by accessing a routing table responsive to the lower-layer information.

The Examiner is of the opinion that Yu shows these features. However, Applicants respectfully submit that the claimed invention is distinguishable over Yu for several reasons. First, Yu does not show associating a higher layer with lower layer information of at least three layers. Also, despite the Examiner's arguments, it is Applicants opinion that Yu does not select a route for the packet through the network by accessing a routing table containing a plurality of routes based on such lower layer information.

Describing Yu at a high level, Yu describes an end point in a network environment; whereas, the presently claimed invention is related to a router which is an intermediate device. All methods described in Yu do not relate to the same environment and have just no common points. Even the routing information provided by some gateway or router to the host or network client has nothing to do with the mechanism of the presently claimed invention. For example, the presently claimed invention is for the network side: router to router connection and is not designed for network to host connectivity or routing. Yu, on the other hand, even if extended to the connectivity to the router, is just a host to router connection. Nothing that is implemented on Yu is useful nor relevant in the presently claimed invention. On the other hand, nothing implemented nor clamed in the present invention relates to router to host communication because

our invention relates to network path optimization and not router to host communication. Even on the last link from the router to the host, the decision is not made on host specificities but just by the egress router based on link properties so that no destination host specificities are used. For the host to router at ingress, there is no relationship as our invention relates to decision on incoming packets and not on the way to force or not some packets to use this routing device. We are just addressing the forward mechanism on the router based on packets characteristics and not on host characteristics so that we do not know nor care on the processes implemented on the host.

Conceptually, processes and methods within a host are always different than a forwarding process and method because a forwarding mechanism means decisions based on received packets and a host transmitting packets does not implement forwarding. On the opposite, a client or host implements a full protocol stack that the router doesn't implement. A gateway may implement such full stack. Now, the present invention allows avoiding implementing such full stack while getting some higher level information. On the reversed case, a host cannot bypass a full stack implementing so cannot implement the processes of the presently claimed invention.

More specifically, Yu is directed to methods and mechanisms used by a computer system which executes application programs originally developed to run on another. In Yu, a virtual network mechanism utilizes a different set of control data structures corresponding to a different one of the virtual host systems. By configuring different sets of structures to operate as a corresponding number of virtual host systems, this enables the routines of the virtual network mechanism used in processing client requests to be shared by the multiple virtual host systems. (col. 3, line 63 to col. 4, line 20.)

Yu does not discloses a configuration table which associates the higher-layer information with lower-layer information carried by at least one of the lowest three layers and a routing table which determines routing of the packet, responsive to the lower-layer information. In Yu, the virtual network (VNET) mechanism 100 operatively couples to the TCP/IP network protocol stack facility 99. The VNET mechanism 100 also couples to a plurality of sets of structures represented by block 102 as shown in Figure 1a located in host system memory which are used

to process client requests received via facility 99 directed to a plurality of virtual host systems/hosted systems.

In Figure 2, the VNET mechanism 100 functionally represents a plurality of virtual host systems ve0 through ve3 running a corresponding number of emulating hosted operating systems. Each virtual host system connects to a local area network which corresponds to the virtual LAN of block 100. To determine the Ethernet address, which corresponds the host system having a particular IP address, an Internet Address Resolution Protocol (ARP) is used wherein a host is allowed to broadcast a special packet on the Ethernet that asks the host with a specified IP address to respond with its Ethernet address. The broadcasting host system can store the response and maintain the mapping between the IP address and the Ethernet address for all future packets designating that IP address. However, there is no disclosure of a configuration table which associates the higher-layer information with lower-layer information.

Still referring to Yu, a gateway (host systems which attach to two or more networks) determines the route of a packet by consulting a network static or dynamic routing table. The static routing uses manual input to update the routing table and the dynamic routing uses routing daemons to update the routing table automatically when new information is received. Therefore, when the host system 20 desires to communicate with the virtual network mechanism 100, it utilizes a route command which allows a user on host system 20 to make manual entries into the network routing tables. Since each IP address includes a network ID and a host ID, the gateways can extract the network ID field from the IP address and route IP packets based solely on the network ID. But, Yu, again, does not disclose a configuration table which associates higher-layer information with lower-layer information and a routing table which determines routing of the packet, responsive to the lower-layer information. Nor does Yu show determining routing of the packet by accessing a routing table responsive to the lower-layer information. The routing, in Yu, would appear to be based on the network ID. And, according to col. 11, lines 42-50

> when host system 20 adds the virtual network IP address to its network routing table, the same routing information is also passed

> to host system 54 through static or dynamic routing and entered into the network routing tables utilized by the IP module of the host system 54 on which the virtual network mechanism 100 resides. Accordingly, ..., the IP module automatically routes those IP packets/designating the virtual LAN to virtual network mechanism 100.

In Figure 3 of Yu, the positioning of the virtual network mechanism 100 relative to the TCP/IP conceptual layered organization is shown. The VNET mechanism 100 couples to the IP layer so that it looks like another network interface to the host operating system TCP/IP protocol stack. The application layer is the level at which the TCP/IP application programs or user processes operate/reside. Although the TCP module handles the establishment and termination of connections between processes, the process does not appear to include reference to the lower levels in order to build a table, nor determining routing of the packet by accessing a routing table responsive to the lower-layer information, for example.

The Examiner is of the opinion that Yu discloses a configuration table using higher layer information with lower layer information of at least three layers and routing table in Figures 2, 4 and 5, and at cols. 10-11, 13, 15 and 16. However, Applicants submit that these features are not shown in these passages and figures. In Figure 2, for example, the IP layer is shown to be attached to the network. Figure 4 shows the interface component connecting to the receive component and echo processing component. Figure 5 shows the client table structures which are used to process client requests directed to the virtual host system by a remotely located client system. By configuring the different sets of structures to operate as a corresponding number of virtual host systems, this enables the routines of the virtual network mechanism used in processing client requests to be shared by the multiple virtual host systems. The virtual network mechanism contains a mapping component which maps the different IP address portions in a predetermined manner. But this mapping component is not the same as the routing table as claimed.

In Figure 5, control structures also designate the client table structures used by its associated virtual host system to process requests received from remotely located client

processes. The client table data structure includes several fields. For example, the client IP address field is used for storing the client IP address while the client tcp dst port field is used for storing the client TCP source port number. The client tcp dst port field is used for storing the client TCP destination port number. However, again, there is simply no disclosure, although a table is shown, that the same processes are used in Yu as in the claimed invention.

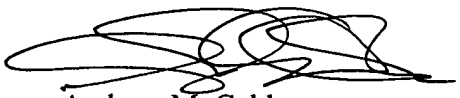
Applicants also submit that the dependent claims are distinguishable based on their dependencies on the respective base claims.

Accordingly, Applicants respectfully request that the rejection over claims 1-15 be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants submit that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby make a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Deposit Account No. 09-0457.

Respectfully submitted,



Andrew M. Calderon
Registration No. 38,093

March 7, 2005

Greenblum and Bernstein P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191